

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (withdrawn): A projection electrode comprising: an electrode section for making contact with a corresponding testing target electrode; and one or a plurality of bumps formed on a surface of this electrode section and having a pointed end or ends.

cl 2. (withdrawn): A projection electrode according to claim 1, wherein the bump has a pointed tapering end in vertical cross-section.

3. (withdrawn): A projection electrode according to claim 1, wherein the bump has a pointed tapering end in vertical cross-section and a ridge-like configuration.

4. (currently amended): A method for forming a projection electrode, comprising:
forming an electrode pattern on a wiring board;
forming a mask pattern on the electrode pattern for masking a portion of the electrode pattern;
wet etching the electrode pattern to form a tapered bump with a sharp pointed end on portions of the electrode pattern not masked by the mask pattern; and
eliminating the mask pattern.

5. (previously presented): The method according to claim 4, further comprising forming a plated layer on the mask pattern-eliminated electrode pattern.

6. (previously presented): The method according to claim 4, wherein said forming a tapering bump comprises isotropically wet etching utilizing a corrosion action of an etching solution from around the mask pattern.

7. (previously presented): The method according to claim 4, further comprising forming a plated layer on the mask pattern-eliminated electrode pattern.

8. (withdrawn): An apparatus for testing an electronic component, comprising: an electrode section set in contact with a testing target electrode; one or a plurality of bumps formed on a surface of the electrode section and having a pointed end; a wiring pattern connected to the bump or bumps; and a testing apparatus body connected to the wiring pattern.

9. (withdrawn): An apparatus according to claim 8, wherein the bump has a pointed tapering end in vertical cross-section.

10. (withdrawn): An apparatus according to claim 8, wherein the bump has a pointed tapering end in vertical cross-section and a ridge-like configuration.

11. (withdrawn): A projection electrode formed in a specific pattern on a wiring board, said projection electrode comprising: a projection formed of an insulating layer and having a cross section shaped like a mountain having a pointed peak; and at least one bump provided on the projection and formed of a metal layer.

12. (withdrawn): The projection electrode according to claim 11, wherein the insulating layer is made of a material selected from the group consisting of polyimide-based resin and epoxy-based resin.

13. (withdrawn): The projection electrode according to claim 11, wherein the metal layer is made of a metal selected from the group consisting of Cu, Ni, Ag, Au, Cr, Pt, Rh and Pd.

14. (withdrawn): The projection electrode according to claim 11, wherein the projection is formed by etching the insulating layer.

15. (withdrawn): The projection electrode according to claim 11, wherein the projection is formed by applying a laser beam to the insulating layer.

16. (withdrawn): The projection electrode according to claim 11, wherein the projection is formed by means of stamping.

17. (withdrawn): The projection electrode according to claim 11, wherein the metal layer is formed by physical vapor deposition or a combination of plating and etching.

18. (withdrawn): The projection electrode according to claim 11, wherein the metal layer comprises a plurality of layers formed one upon another.

19. (withdrawn): A method for forming a projection electrode in a specific pattern on a wiring board and having at least one bump which has a cross section shaped like a mountain having a pointed peak, said method comprising the steps of: processing an insulating layer, thereby forming a projection having a cross section shaped like a mountain; forming a metal layer on the projection formed of the insulating layer; and removing a part of the metal layer.

20. (withdrawn): The method according to claim 19, wherein the step of processing an insulating layer is a step of performing isotropic etching on the insulating layer.

21. (withdrawn): The method according to claim 19, wherein the step of processing an insulating layer is a step of applying a laser beam to the insulating layer.

22. (withdrawn): The method according to claim 19, wherein the step of processing an insulating layer is a step of pressing a stamper onto the insulating layer before the insulating layer is hardened completely, said stamper having a groove identical in shape to the projection.

23. (withdrawn): The method according to claim 19, wherein the step of forming the metal layer is a step of performing physical vapor deposition or a combination of plating and etching, thereby to form a metal layer in a prescribed pattern.

24. (withdrawn): A testing apparatus for testing electronic components, said apparatus comprising: a wiring board having; and a projection electrode which is formed on the wiring board, which is to contact an electrode of an electronic component and which comprises: a projection formed of an insulating layer and having a cross section shaped like a mountain having a pointed peak; and at least one bump provided on the projection and formed of a metal layer.

25. (currently amended): A method for forming a projection electrode, comprising:
forming an electrode pattern on an electronic device;
forming a dry-film resist on the electrode pattern for masking a portion of the electrode pattern;

etching the electrode pattern to form sharp pointed bump portions on the unmasked electrode pattern not masked by the dry-film resist; and eliminating the mask pattern.

26. (previously presented): The method as claimed in claim 25, wherein said etching comprises isotropically wet-etching the unmasked portions of the electrode pattern.

27. (previously presented): The method as claimed in claim 25, further comprising plating the etched portions of the electrode pattern.

28. (previously presented): The method as claimed in claim 27, wherein said plating comprises forming a layer of material the etched portions of the electrode pattern, the material comprising at least one material selected from the group of rhodium, palladium and gold.

29. (currently amended): A method for forming a projection electrode, comprising:
forming an electrode pattern on an electronic device;
forming a dry-film resist on the electrode pattern for masking a portion of the electrode pattern;
etching the electrode pattern to form sharp pointed blade-shaped bump portions on the unmasked electrode pattern not masked by the dry-film resist;
eliminating the mask pattern.

30. (previously presented): A method as claimed in claim 29, wherein the blade-shaped portions are parallel.

31. (currently amended): A method for forming a projection electrode, comprising:
forming an electrode pattern on an electronic device;
forming a dry-film resist on the electrode pattern for masking a portion of the electrode pattern;
etching the electrode pattern to form pointed bump portions on the unmasked electrode pattern not masked by the dry-film resist, wherein each pointed bump portion has a ~~beveled gear-shaped~~ star-shaped cross section; and
eliminating the mask pattern.

32. (new): A method for forming a projection electrode, the method comprising:
forming an electrode pattern on an electronic device;
forming a resist pattern on the electrode pattern, wherein the resist pattern is operable to cover a portion of the electrode pattern;
etching the electrode pattern through the resist pattern to form at least one sharp pointed bump portion on the unmasked portion of the electrode pattern, wherein the at least one pointed bump portion has a star-shaped cross section.

33. (new): A method as set forth in claim 32, wherein during said etching, the resist pattern remains in constant contact with a peripheral portion of the electrode pattern.

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34. (new): A method as set forth in claim 32, wherein during said etching, the resist pattern comprises a plurality of circular portions equally spaced from one another.

35. (new): A method as set forth in claim 34, wherein as a result of said etching, the sharp pointed bump portions have a star-shaped cross section.
